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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

In the Matter Of:

Amendment of the Commission's
Rules To Establish New Personal
Communications Services

)
) GEN Docket No. 90-314
) ET Docket No. 92-100
)
) RM-7140, RM-7175, RM-7617,
) RM-7618, RM-7760, RM-7782,
) RM-7860, RM-7977, RM-7978,
) RM-7979, RM-7980
)
) PP-35 through PP-40,
) PP-79 through PP-85

**ORIGINAL
FILE**

COMMENTS OF McCaw CELLULAR COMMUNICATIONS, INC.

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SUMMARY

From inception, McCaw has focused its resources on expanding the scope of wireless communications services throughout the United States. McCaw's fundamental goal is to create a network of flexible, fully integrated wireless personal communications services that can be custom designed to meet each consumer's needs. An intelligent and ubiquitous network will empower individuals to control how they receive communications and also enable them to call people rather than places. McCaw foresees that all of the capabilities of this network will be accessed by a single, palm-sized handset, which will act as a gateway to a full range of consumer and business services, including voice, data, and image transmission. In short, McCaw envisions an intelligent, wireless network available to all Americans, urban and rural alike, allowing users to communicate when and how they want.

McCaw thus has a vital stake in the allocation of 2 GHz frequencies for personal communications services. The availability of PCS spectrum offers McCaw both the opportunity to supplement its cellular offerings with new services within its existing markets and the chance to expand its network into new territories as well. McCaw is also aware that a wide array of other companies, many of them established communications providers, are eager to invest in PCS, and that the Commission must craft a regulatory strategy that accommodates these contending visions with the overall goal of promoting convenient, inexpensive wireless telecommunications services throughout the country.

The Commission's *Notice* responds to this challenge by adopting a regulatory model founded on a competitive marketplace and designed to allow 2 GHz PCS licensees significant flexibility to satisfy consumer demands. The Commission has wisely identified four

touchstone values in resolving the long list of policy decisions that must be made before 2 GHz PCS can become a reality. Those core values are: universality, diversity of services, speed of deployment and competitive delivery.

McCaw wholeheartedly supports the Commission's reliance on these basic goals. However, McCaw also believes that several specific proposals in the *Notice* are inconsistent with the Commission's stated objectives and may frustrate the efficient development of 2 GHz PCS systems in the United States. The following comments seek to highlight these discrepancies and provide constructive proposals for resolving the issues in a manner maximizing the enumerated values:

Number of Licensees. PCS allocations should maximize the number of spectrum opportunities for new services within the 1850-1990 MHz band. McCaw submits that at least 5 licensed providers could be authorized using 20 MHz allocations, a sufficient bandwidth economically and viably to deploy substantial new PCS offerings. In addition, a 20 MHz allocation -- from 1910-1930 MHz -- would be appropriate for unlicensed PCS devices. The remaining 20 MHz could be held in reserve for future needs, or, alternatively, the Commission could authorize one or two additional providers with 10 or 20 MHz each.

Market Areas. Service areas used for licensing 2 GHz systems should reflect the highly localized characteristics of microcellular PCS services. Due to technical and economic factors peculiar to 2 GHz PCS systems, broad grants of exclusive territory are not only unnecessary but unduly restrict entry opportunities as well. Use of established mobile service areas -- rather than maps arbitrarily taken from an atlas company -- have the benefit of recognized boundaries compatible with existing PCS services. For these reasons, McCaw

believes that PCS services should be licensed using the same MSA and RSA market divisions used for cellular licensing.

Eligibility. There should be no set-asides or exclusions for new mobile services spectrum in the 2 GHz band. Cellular carriers, in particular, should be entitled to pursue new spectrum opportunities without limitation. Cellular carriers have made a substantial contribution to mobile services generally. In so doing, they have amassed experience and expertise in creating the established wireless infrastructures that could form the backbone for ubiquitous national personal communications services. Cellular carriers also will continue to be highly aggressive and competitive entrants in the PCS field. If given the opportunity, cellular carriers will continue to pioneer new PCS applications that supplement cellular service in existing markets and that expand their wireless networks to new areas. Accordingly, restrictions on the ability of cellular carriers to pursue new spectrum opportunities are unwarranted, patently unfair, and bad public policy.

Licensing. Licensing policies should prevent speculation while preferring experienced and highly qualified applicants. In order to achieve this goal, the licensing mechanism must depend on the PCS market structure adopted by the Commission. If entry opportunities are restricted, comparative hearings are essential. If, as McCaw advocates, there are numerous licenses per market and MSAs and RSAs are used for licensing, auctions or reformed lotteries could offer efficiencies without severely detracting from the Commission's ability to ensure qualified entrants. In any event, threshold qualification criteria are required to stem the onslaught of insincere applications plaguing the introduction of new mobile services.

Technical Standards. Technical standards properly should be, as the Commission suggests, left to the industry standards groups for resolution. At this time, it would be premature to mandate comprehensive interoperability requirements for personal communications services. And, as the efforts to date have shown, the industry is capable of developing consensus standards as the need arises.

Regulatory Parity. Comparable regulatory ground rules must be adopted for all existing and proposed licensed personal communications services. In its efforts to develop an appropriate regulatory classification scheme for licensed PCS, the Commission is examining a variety of private and common carrier options while exploring limited regulatory reforms for existing carriers. Unless the Commission develops comprehensive symmetrical regulatory policies for all existing and new providers of wireless communications services, however, the proposed regulatory regime holds the potential to undermine competitive delivery of existing and emerging personal communications services. Regulatory parity for all carriers across the expansive range of services considered "PCS" is a prerequisite to a robustly competitive market.

The Commission's *Notice* is a critically important opportunity to build a foundation for the way that mobile services are offered for the future. The policies adopted herein will govern the momentous transition from a wired network to the nation's wireless future. Consequently, it is of the utmost importance that the policies the Commission ultimately adopts seek to create a balanced and competitive marketplace to ensure the prompt delivery of a low cost, high quality menu of services to the public. McCaw submits that its proposed revisions to the tentative policies advanced in the *Notice*, as discussed below, will serve that goal.

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COMMENTS OF McCaw CELLULAR COMMUNICATIONS, INC.

McCaw Cellular Communications, Inc. ("McCaw") herewith submits its initial comments in response to the Commission's Notice of Proposed Rulemaking on Personal Communications Services ("PCS").¹ The *Notice* catalogs a daunting array of questions that must be resolved if personal communications services are to flourish in the 2 GHz band, and if the promise of wireless communications is to be realized in this country.

Wisely, the Commission attempts to chart its course into the PCS frontier guided by a sound regulatory compass whose cardinal symbols are universality, diversity of service, speed of deployment and competitive delivery. McCaw wholeheartedly supports the use of these benchmarks. If the Commission applies them consistently, it will find that successful strategies for introducing PCS in the 2 GHz band are surprisingly straightforward:

¹ *Amendment of the Commission's Rules To Establish New Personal Communications Services*, FCC 92-333 (Aug. 14, 1992) ["*Notice*"].

- ***Grant as many licenses per market area as technically feasible, using moderately-sized frequency allocations.*** Allocating spectrum in this manner will promote competition and spectrum efficiency and allow other uses of spectrum in markets that may attract only a few licensees.
- ***Use moderately-sized market areas based upon established MSA/RSA boundaries.*** Rather than using statewide or nationwide markets, the Commission should use more moderately-sized markets to accommodate a variety of entrepreneurs as well as established communications providers and to promote the prompt introduction of PCS in all areas of the country, including rural areas.
- ***Open PCS licensing eligibility to all categories of PCS applicants.*** The Commission would promote competition and service innovation by rejecting both set-asides and categorical exclusions in favor of allowing any interested, qualified entity to provide service.
- ***Apply the same regulatory rules to similar service offerings.*** Only by creating a marketplace in which all competitors compete under the same rules will the Commission meet its goal of creating a diverse menu of low-cost, high quality services.

These strategies will ensure that the Commission's four core PCS values will be optimized and that the Commission's efforts to redevelop the 2 GHz² band will realize the fullest benefits of new personal communications services for the public.

I. THE COMMISSION HAS IDENTIFIED IMPORTANT GOALS FOR NEW PERSONAL COMMUNICATIONS SERVICES

In crafting a regulatory structure for new 2 GHz spectrum allocations, the Commission seeks to achieve four important goals: universality, speed of deployment,

² Because the Commission is considering relocation and compensation issues related to the existing microwave users of the 1850-1990 MHz band in a comprehensive related docket, McCaw does not discuss relocation and compensation issues in these comments. McCaw will continue to be an active participant in the emerging technologies rulemaking. See *Redevelopment of Spectrum To Encourage Innovation in the Use of New Telecommunications Technologies*, ET Docket No. 92-9.

diversity of services, and competitive delivery.³ Experience demonstrates that these objectives will be accomplished most efficiently if market forces are allowed to operate freely and are not diverted by regulatory intrusions. In short, the Commission should strive to create opportunities for entrepreneurship and should earnestly avoid any scheme of regulation that fosters an artificial scarcity of spectrum, which inevitably results in speculative mischief. McCaw thus supports general policies allowing licensees broad flexibility and favoring reliance upon marketplace competition rather than comprehensive regulation.

Universality. The first of the Commission's goals, universality, properly emphasizes reaching the broadest base of consumers possible. Wireless technologies have and will continue to benefit the public greatly by offering increased convenience and accessibility through person-oriented rather than station-oriented calling. These potential benefits, however, have not been and should not be limited to consumers in major metropolitan areas. In particular, the licensing scheme adopted by the Commission should promote, to the extent economically feasible, prompt deployment of service in rural areas.

Speed of Deployment. The *Notice* recognizes and seeks to avoid the "regulatory morass" that plagued the introduction of mobile services in the past.⁴ Fortunately, the Commission has nearly cleared what has historically been the most troublesome hurdle to the deployment of mobile services -- the re-allocation of frequency from other users. It must now focus on developing an approach to spectrum assignment that accelerates actual service

³ *Notice* at ¶6.

⁴ *Notice* at ¶7.

deployment in all areas of the United States. Rapid deployment of new 2 GHz services will not only benefit customers individually, but it will also enhance U.S. competitiveness by allowing domestic manufacturers to continue their global leadership role in PCS, and stimulate needed economic growth.

Service Diversity. Diversity of services, the Commission's third goal, suitably recognizes that PCS is a broad term covering an expansive family of wireless services, including service concepts that are unimagined today. The Commission's open-ended characterization of PCS benefits consumers, whose menu of personalized wireless services will continue to expand and diversify, enabling them to tailor communications to their individualized needs.

Competitive Delivery. The Commission's fourth and final goal for PCS is competitive delivery. Historically, competition has served the public interest by lowering prices, increasing diversity, and improving the quality of service. For 2 GHz PCS services, a wide variety of technologies and business strategies will promote efficiency, stimulate innovation, and reduce the need for comprehensive regulation. These benefits can be realized in an open, competitive market with regulatory parity for all participants.

The optimum method for achieving a proper balancing of these goals, as reflected in the *Notice*,⁵ is the development of flexible rules and conditions conducive to fostering an open market. Without regulatory flexibility, for example, the diversity of services certainly would be constrained. Similarly, in the absence of competitive market forces, a PCS carrier

⁵ *Notice* at ¶2.

might be tempted to forego -- or unnecessarily delay -- service outside the highest population density areas. If, however, licensees operate as free agents in a competitive market, significant incentives will exist to offer the highest quality and variety of service at the lowest rates, ubiquitously and promptly.

II. PCS ALLOCATION POLICIES SHOULD MAXIMIZE THE NUMBER OF NEW SERVICES PROVIDERS

In order to stimulate competition among personal communications services of all types, McCaw believes that allocation policies should seek to create the widest and most diverse number of entry opportunities in the 140 MHz tentatively designated for 2 GHz PCS operations. In order to achieve this goal, the Commission should allocate spectrum for licensed PCS providers in blocks of 20 MHz each -- an allocation that will permit robust, economic, and viable wireless service. Applying principles dictated by the current usage of the band, McCaw submits that at least five two-way PCS licenses could thus be granted. An additional 20 MHz should be designated for unlicensed PCS devices, as the *Notice* recommends. The remaining 20 MHz in the 1850-1990 MHz band can be held in reserve for future PCS demands, licensed or unlicensed.

A. ENTRY OPPORTUNITIES FOR LICENSED PCS SERVICES SHOULD BE MAXIMIZED

The Commission has recognized that the ultimate solution for creating a wholly competitive PCS market is "to accommodate all entities interested in providing PCS

services."⁶ Obviously, it is impossible to grant spectrum to everyone who has expressed a desire to offer wireless services in the 2 GHz band. But if the Commission cannot accommodate *all* interested participants, it clearly should accommodate as many entrants as technically possible on the spectrum available. Inexplicably, however, the *Notice* pursues an alternate course that, based on inflated spectrum requirements for licensed PCS operations, imposes artificial entry limitations and increases the likelihood 2 GHz PCS spectrum will be underutilized.⁷ In particular, the *Notice* proposes three allocations of 30 MHz each for licensed PCS services.⁸ As discussed below, the available spectrum can and should support at least five licensed PCS systems of 20 MHz each.

**1. 20 MHz Allocations Are Appropriate for Licensed
2 GHz PCS Systems**

McCaw believes the amount of spectrum initially licensed to each PCS carrier should be determined by the amount of bandwidth needed as a building block to implement a technically and economically effective new offering. Under this analysis, allocations of 20 MHz are appropriate. McCaw is aware that many PCS proponents have claimed that each licensee requires a greater amount of frequency. In fact, a 20 MHz allocation is more than generous.

⁶ *Notice* at ¶34.

⁷ *Notice* at ¶35.

⁸ *Notice* at ¶37.

Telocator has postulated total combined clear spectrum needs for "personal telecommunications services" and "advanced telepoint" as 84 MHz for a single provider using "current technology" and "optimistic deployment."⁹ Examining Telocator's assumptions, however, it is apparent that these deployment scenarios are excessively conservative. Telocator has used a duplex channel bandwidth of 100 kHz, the bandwidth currently used in the Digital European Cordless Telecommunications ("DECT") standard.¹⁰ DECT, however, uses such a large bandwidth to enable omni re-use factors ranging down to $N=1$, whereas Telocator's estimates utilize a re-use factor of $N=12$. If a re-use factor more appropriate for a 100 kHz channel bandwidth is used, the total clear spectrum requirements drop precipitously. Similarly, if a duplex channel bandwidth and re-use factor similar to 800 MHz digital cellular is used, *i.e.*, an omni re-use factor of $N=7$ and duplex channel bandwidth of 20 kHz,¹¹ total clear spectrum needs are significantly lower than Telocator's estimates.¹²

In effect, Telocator's estimates mask the economic decision involved in balancing cell re-use and density of base stations. Certainly, infrastructure costs are lower with larger grants of spectrum to each licensee. At the same time, however, DECT plans to utilize a

⁹ Telocator PCS Technical and Engineering Committee, *Telocator Spectrum Estimates for PCS Report* at 3 (May 28, 1992).

¹⁰ European Telecommunications Standards Institute, *Digital European Cordless Telecommunications Common Interface Service and Facilities Requirements Specification* (Mar. 1992) ["DECT Standard"].

¹¹ Cellular telephone systems utilize two 30 kHz channels for a 60 kHz duplex channel; however, digital cellular utilizes a time division multiple access scheme that provides 3 virtual channels for each actual channel. Accordingly, each virtual channel has an effective duplex bandwidth of 20 kHz.

¹² *DECT Standard* at 77.

mere 20 MHz to support traffic densities up to 10,000 Erlangs per square kilometer. Consequently, spectrum allocations of more than 20 MHz -- especially where multiple allocations will be provided for -- appear grossly inefficient.

Under these circumstances, the *Notice's* tentative proposal to allocate 30 MHz for 2 GHz PCS systems is excessive.¹³ The 30 MHz benchmark is not based upon technical research but rather a policy goal of ensuring "comparability" with cellular. This objective is wholly inappropriate given that, until the issuance of the *Notice*, "PCS" and "digital microcellular service" had been virtually synonymous. In fact, many proponents of 2 GHz allocations for new PCS licenses have argued that 2 GHz is well-suited for high density, spectrum efficient wireless services precisely because it is compatible with microcellular designs. The *Notice* inexplicably and abruptly reverses this orientation and adopts an emphasis of comparability with 800 MHz cellular service, a predominately macrocellular offering. If the Commission inadvisably pursues this new course, it risks assigning too much spectrum per licensee, with the result that spectrum will not be efficiently used and that other PCS operators will be excluded unnecessarily.

McCaw believes the promise of PCS is to bring new offerings to the public. A 20 MHz building block approach to spectrum allocations ensures that each new provider has the requisite opportunity to launch a new service, whether that service is digital microcellular voice, mobile facsimile, high speed data, or even portable video applications. The

¹³ Indeed, cellular carriers were originally authorized only 20 MHz to provide *analog macrocellular* services. *Compare Cellular Communications Systems*, 86 F.C.C.2d 469 (1981), *modified* 89 F.C.C.2d 58 (1982), *with Cellular Communications Systems*, FCC 86-333 (July 24, 1986).

Commission's cellular comparability approach, on the other hand, appears calculated to recreate existing 800 MHz cellular services in the 2 GHz band, only without an analog customer base and with significantly more spectrum. This completely reverses the goal of fostering diversity of service.

Furthermore, there is no sound basis to believe that 30 MHz allocations are needed to ensure comparability with cellular capacity in any event. As the Commission has recognized, new PCS entrants will be able to deploy digital multiple access technologies from the outset.¹⁴ For example, Enhanced Specialized Mobile Radio ("ESMR") systems, like 2 GHz PCS systems, use digital multiple access techniques to achieve capacity similar to existing 800 MHz cellular systems with a fraction of the spectrum.¹⁵ And, PCS providers will have contiguous spectrum, unlike ESMR providers. Consequently, new PCS entrants should require *less* spectrum than the 25 MHz allocated to 800 MHz cellular systems.¹⁶

¹⁴ Notice at ¶36.

¹⁵ In Fleet Call, Inc.'s original waiver request, for example, it states its ESMR conversion would enable capacity increases of 15 times (or more) and states that it has 299 channels in San Francisco (~15 MHz). *Fleet Call, Inc.*, LMK-90036 (Apr. 5, 1990).

¹⁶ McCaw recognizes that the full amount of spectrum allocated to a licensed PCS system may not be available from the outset. As the Commission has noted, "[i]f sharing is required, the capacity of spectrum available to PCS services would be limited. . ." Notice at ¶35. Nonetheless, the Commission has expended considerable resources ensuring that new PCS licensees will be able to relocate existing fixed users if demand for licensed 2 GHz PCS services exceeds available spectrum capacity. *Redevelopment of the Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, FCC 92-437 (Oct. 16, 1992). Indeed, the current proposal in ET Docket 92-9 would allow any new licensed PCS provider to negotiate a voluntary relocation of any 2 GHz fixed microwave user at any time. Because even the most optimistic studies indicate that consumer adoption of PCS will not be overwhelming in the near term, new PCS carriers will be able to engage in incremental relocation of existing users. Thus, all of the costs of relocation will not be borne "up front" in order to initiate service.

(continued...)

2. Competitive Policies Favor Creating At Least Five Licensed PCS Allocations

Given the existing channelization and separations used in the band, McCaw believes that a total of 100 MHz should be allocated immediately for licensed PCS operations, and 20 MHz held in reserve for future PCS needs, whether licensed or unlicensed. This allocation would permit the immediate launch of at least five licensed systems in each market.

Overall, there are 140 MHz available from 1850-1990 MHz appropriate for PCS use.¹⁷ Due to the channelization of the band and other factors discussed *infra*, 20 MHz of this band from 1910-1930 MHz logically should be dedicated to unlicensed PCS services. As a result, 120 MHz of paired spectrum, with 80 MHz separation, is available for licensed

¹⁶(...continued)

In this regard, many parties have devoted significant capital and resources to experimental operations exploring the feasibility of various spectrum management options. Specifically, Personal Communications Network Services of New York ("PCNS-NY") has learned that "typical use to capacity by existing private microwave users in the New York City metropolitan area is generally less than 50%." PCNS-NY thus has proposed to "replace the facilities of existing private microwave users . . . by migrating these users to the common carrier facilities of its parent company, LOCATE," thereby providing the private microwave user with increased digital T-1 capability and fully digital facilities. *Remarks of R. Craig Roos, President, Personal Communications Network Services of New York, Inc.*, FCC PCS *En Banc* Hearing (Dec. 5, 1991), filed in GEN. Docket No. 90-314 (Nov. 21, 1991). In a similar vein, American Personal Communications, Inc.'s ("APC") Frequency Agile Sharing Technique ("FAST") Study indicates that, even in the top-11 markets, at least 35 percent of the spectrum in the 1850-1990 MHz band is available for start-up PCS operations at the vast majority of locations, without relocation of or interference to OFS incumbents. APC also notes that "[m]ore than 90 percent of [Operational Fixed Service] usage is more than 10 miles from city centers, where PCS subscriber densities are likely to be greatest." *Statement of J. Barclay Jones, Vice President for Engineering, American Personal Communications* at 3-4, FCC PCS *En Banc* Hearing (Dec. 5, 1991), filed in GEN. Docket No. 90-314 (Nov. 21, 1991).

¹⁷ Although the *Notice* tentatively proposes to utilize only 110 MHz of the available 140 MHz, comments are solicited on channelization plans that would allow up to five providers with 40 MHz each -- a total of 220 MHz, including the 20 MHz allocation for unlicensed devices. *Notice* at ¶40. Channelization plans that exceed the 140 MHz available, however, require "different separations for at least some of the licenses as well as the allocation of additional spectrum from one of the other proposed emerging technologies bands." *Notice* at ¶40. For these reasons, McCaw submits that only 140 MHz should be considered for PCS operations at this time.

PCS use. These allocations should be channelized with the current 80 MHz separation used in the band to facilitate negotiations with incumbent users.¹⁸

With consistent 20 MHz channelization, five systems clearly could be allocated, leaving 20 MHz as a reserve for either future licensed or unlicensed 2 GHz services. Alternatively, the remaining 20 MHz could be used to authorize a sixth provider, or even two additional providers with 10 MHz each. Such 10 MHz systems could be used to deploy stand alone PCS systems or could be combined with existing infrastructures -- such as cellular, cable, or telephone networks -- to create viable systems. Indeed, the Commission has invited comment on a single 10 MHz allocation precisely for such reasons.¹⁹

There is no sound policy reason to limit artificially the number of service providers. Although some have argued that the market will only support two or three competitors, their arguments sound suspiciously like the type of regulatory barriers to competition that underlay past mobile service policies requiring showings of need for additional providers and demonstrations that competition would not have an adverse economic impact upon existing service providers. These arguments have been thoroughly repudiated by the FCC.²⁰

¹⁸ As the Commission observes, "maintaining the same separation as for fixed microwave services simplifies the negotiation process; successful negotiations with a microwave user will clear a channel pair for the PCS operation." *Notice* at ¶39.

¹⁹ As discussed in Section IV(B), however, there should be no entry restrictions for these allocations.

²⁰ *Petition for Reconsideration of Amendment of Parts 2 and 73 of the Commission's Rules Concerning Use of Subsidiary Communications Authorization*, 55 Rad. Reg. 2d (P & F) 1607, 1614 (1984), *rev'd on other grounds California v. FCC*, 798 F.2d 1515 (D.C. Cir. 1986).

B. THE PROPOSAL TO ALLOCATE 1910-1930 MHZ FOR UNLICENSED PCS DEVICES IS IN THE PUBLIC INTEREST

McCaw has been a longtime proponent of an allocation for unlicensed PCS services. Such devices, including wireless PBXs, wireless Local Area Networks for computers, as well as residential and "campus" cordless phones, offer significant benefits to the public and, unlike licensed PCS services, can be deployed rapidly and easily. An immediate spectrum allocation to support these devices will directly advance the Commission's goal of rapidly bringing service to the public, stimulate diversity in PCS by allowing the entry of a wide range of manufacturers, promote universality through inexpensive equipment offerings that can be deployed anywhere in the United States, and enhance competition by providing fixed cost alternatives to PCS offerings based on recurring access charges.

McCaw also strongly supports the specific allocation proposal to dedicate 1910-1930 MHz for unlicensed PCS devices. The 1850-1990 MHz band, which has been tentatively identified for PCS services, is channelized into two-way segments at 1850-1910 and 1930-1990 MHz and into a one-way segment from 1910-1930 MHz. Due to the usage patterns of microwave licensees, however, the 1910-1930 MHz band is relatively lightly used -- "there are only 28 microwave receivers in the 1910-1930 MHz band located within a 10 mile radius of the center of the top 50 Metropolitan Statistical Areas."²¹ These characteristics make the band ideal for unlicensed device usage. Because the band is not channelized for two-way operation, it is not suitable for licensed PCS operations. And, because there are a minimal

²¹ Notice at ¶43 n.31. In fact, there are only approximately 500 facilities located in the entire band, with heavy regional concentration in the Gulf of Mexico area.

number of licensees, the problems in negotiating relocation of and compensating existing fixed users in the absence of a single definable new entrant are minimized.

III. SERVICE AREAS SHOULD REFLECT THE LOCALIZED MICROCELLULAR CHARACTERISTICS OF NEW PCS SYSTEMS

A. NEW LICENSED PCS SYSTEMS ARE LIKELY TO BE HIGHLY LOCALIZED

The *Notice* tentatively concludes that "PCS service areas should be larger than those initially licensed in cellular."²² This conclusion was reached primarily because the Commission observed a regionalization trend in the provision of cellular service and postulated that the same economies of scale would apply to 2 GHz PCS.²³ McCaw believes the Commission's tentative conclusion should be revisited because there is evidence to suggest microcellular PCS will not offer the same geographic coverage as existing macrocellular services.

In contrast to existing cellular services, new PCS systems are likely to be highly localized in nature. From its inception, the driving technology behind the major licensed PCS concept, "personal communications networks," has been the use of microcellular technology. This technology is well adapted to the 2 GHz band, since signal propagation at 2 GHz is more limited than propagation at lower allocations for two-way voice service, allowing cells to be packed closer without interference. In addition, if 2 GHz service

²² *Notice* at ¶60.

²³ *Notice* at ¶58.

providers are going to achieve the targeted price levels suggested in earlier comment rounds in this proceeding, they must resort to high density cell packing in order to achieve the traffic capacities necessary for mass-market services. As a final matter, low-powered licensed PCS services are critical to support lightweight portable phones with long talk-times as originally envisioned.

The use of microcellular technology, however, will limit 2 GHz PCS to pockets of localized service. The costs of deploying the densely packed infrastructure for 2 GHz personal communications services, for example, will dictate minimum subscriber densities that are likely to be found only in the central regions of major metropolitan areas. Furthermore, because of the number of hand-offs required in a microcellular system at highway speeds, it is unlikely that 2 GHz PCS will ever become a reliable vehicular service.²⁴ Consequently, 2 GHz PCS services are likely to have smaller operating areas than cellular services, will be highly concentrated in urban areas, and will not expand to cover major thoroughfares extending out from population centers.

B. MSA/RSA DIVISIONS BEST SERVE THE COMMISSION'S GOALS

The *Notice* recognizes, to a degree, that there are benefits associated with smaller licensing areas. In particular, the *Notice* states that smaller license areas "may permit a broader participation by firms of all sizes in the PCS market" and "may minimize certain transaction costs . . . such as subcontracting with other companies to provide service in these

²⁴ See, e.g., *Comments of GTE Service Corporation* at 9-11, GEN Docket No. 90-314 (Oct. 1, 1990).

smaller cities and communities."²⁵ McCaw believes that the effect of the benefits through the use of MSA/RSA licensing have been understated and that there are additional reasons favoring MSA/RSA licensing unaddressed by the Commission.

Diversity of Provision. Use of smaller licensing areas would significantly increase the diversity of firms participating in providing 2 GHz PCS services. As the Commission recognized, "[b]roader participation also may produce a greater diversity and degree of technical and service innovation than would be expected from a few large firms."²⁶ Notably, of the 40 pioneer's preference applications placed on public notice on May 11, 1992, the large majority of the requested preference areas would be consistent with the use of MSA/RSA divisions. Because diversity of service is one of the Commission's primary goals for PCS policies, the broader participation enabled by use of MSA/RSA boundaries serves the public interest.

Established Territories in Excess of Needs. As discussed above, 2 GHz PCS operating areas will be highly localized; even service areas based upon the MSA/RSA model -- not to mention the other alternatives -- would provide geographic territory in excess of PCS licensees' needs. At the same time, MSAs and RSAs provide for ease of implementation because MSAs and RSAs have the advantage of relying on a known and established set of boundaries designed for mobile service needs. Furthermore, these

²⁵ Notice at ¶59.

²⁶ Notice at ¶59.

boundaries have also been used in licensing Interactive Video and Data Services ("IVDS").²⁷

Speed of Deployment. Because the MSAs and RSAs are now well-known and defined territories, licensing could proceed orderly and rapidly.²⁸ The Commission, in fact, adopted pre-designated filing areas for cellular precisely for the reason of promoting orderly development of the cellular industry and concentrating the resources of the industry first on the markets that most urgently needed additional mobile communications capacity.²⁹ The use of MSA/RSA boundaries for PCS licensing will accomplish similar goals, but will not be delayed by the time required to develop and refine these filing areas.³⁰

²⁷ *Amendment of Parts 0, 1, 2, and 95 of the Commission's Rules to Provide Interactive Video and Data Services*, 7 FCC Rcd 1630 (1992).

²⁸ Oddly enough, policy considerations suggest that nationwide or Major Trading Area-based licenses should be granted only after comparative hearings, while MSA/RSA-based licenses may more justifiably be awarded through lotteries or auctions. See Section V(A). Thus, it is not at all clear that larger license areas are synonymous with an expeditious licensing process.

²⁹ See also *Amendment of Parts 0, 1, 2, and 95 of the Commission's Rules to Provide Interactive Video and Data Services*, 7 FCC Rcd at 1638 (stating "[w]e agree that pre-designated filing areas will reduce the administrative burdens on both the public and the Commission . . . [and] eliminate daisy-chains and thus allow the Commission to license IVDS systems much more quickly, especially in the more populated areas of the country").

³⁰ The Commission's adoption of MSAs and RSAs for assigning cellular licenses was an evolutionary process. In the order establishing the cellular service, the Commission expected that applicants would define their own proposed service areas, that applications would be filed in accordance with the standard public notice and cutoff procedures generally applied to Part 22 mobile service applicants, and that modified comparative hearings would be employed. *Cellular Communications Systems*, 86 F.C.C.2d 469, 499, 509, 510 (1981), modified 89 F.C.C.2d 58 (1982), further modified 90 F.C.C.2d 571 (1982) appeal dismissed sub nom. *United States v. FCC*, No. 82-1526 (D.C. Cir. 1983). Applications were to be accepted beginning on November 23, 1981. *Id.* at 513. This date was delayed pending Commission review and action on petitions for reconsideration and clarification. *Cellular Communications Systems*, 87 F.C.C.2d 1072, 1073-74 (1981). In acting on those petitions, the Commission decided to limit Cellular Geographic Service Areas ("CGSAs") to Standard Metropolitan Statistical Areas (now referred to as MSAs). *Cellular Communications Systems*, 89 F.C.C.2d 58, 86 (1982). At the same time, the Commission decided to accept applications for the top 30

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There also is reason to believe that a licensee authorized to provide 2 GHz PCS service in a smaller market will move more quickly to implement service after receiving a license than would a firm authorized for a larger region. As discussed above, a national or regional licensee may take years to implement service in the territory defined as the 150th ranked MSA, whereas a licensee who receives an authorization only for the 150th ranked MSA will deploy service there as soon as practicable. In effect, as the licensing area grows, the incentive rapidly to provide ubiquitous service drops precipitously.

Spectrum Efficiency. MSAs and RSAs also minimize spectrum inefficiency by creating less extensive licensing areas. In the 800 MHz cellular service, there were RSAs that apparently would not economically support stand-alone service, since the facilities were not constructed on a timely basis and the authorizations were terminated.³¹ For

³⁰(...continued)

markets on a fixed date. *Id.* at 87-88. The Commission planned to permit the filing of applications for all other areas ninety days after that date. *Id.* at 88. The Commission later adopted staggered date certain filing procedures for the MSAs below the top 30. *Cellular Communications Systems*, 90 F.C.C.2d 571, 574-75 (1982); *FCC Public Notice*, "Commission Announces Cellular Markets Beyond 90 Largest," Rpt. No. CL-69 (May 17, 1984). After receiving applications for markets 31-90, the Commission proposed and adopted rules to process all cellular applications for markets below the top 30 by means of lotteries. *Cellular Lottery Order*, 98 F.C.C.2d 175 (1984), *modified* 101 F.C.C.2d 577 (1985), *further modified*, 59 Rad. Reg. 2d (P & F) 407 (1985), *aff'd in part & rev'd in part Maxcell Telecom Plus v. FCC*, 815 F.2d 1551 (D.C. Cir. 1987).

The Commission subsequently adopted rules for licensing cellular providers in areas outside of the MSAs -- the areas now known as RSAs. These areas were not previously defined by the Census Bureau as had been the MSAs. Rather, the FCC proposed, accepted comments, and adopted the RSA boundaries. In addition, the Commission addressed proposals for revising its procedures for the filing and processing of cellular applications in RSAs. *See Rural Cellular Service*, 60 Rad. Reg. 2d (P & F) 1029 (1986), *modified* 2 FCC Rcd 733 (1987), *further modified* 2 FCC Rcd 3366 (1987), 4 FCC Rcd 5272 (1988), 3 FCC Rcd 4050 (1988), and 4 FCC Rcd 4464 (1989).

³¹ *FCC Public Notices*, "Termination of Cellular Authorizations," Market 722A Wyoming 5 - Converse RSA, Mimeo. No. 11718 (Feb. 11, 1991); Market 525A Montana 3 - Phillips RSA, Mimeo. No. 11874 (Feb. 21, 1991); Market 390A Idaho 3 - Lemhi RSA, Mimeo. No. 13334 (May 31, 1991); Market 485A Minnesota 4 - Lake RSA, Mimeo. No. 22457 (Mar. 30, 1992); Market 650A Tennessee 8 - Johnson RSA, Mimeo. No. 22621 (Apr. 9, 1992). As a result, these markets will be licensed as unserved areas.